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SPECIFICATION FOR ENDOSULFAN, TECHNICAL

(First Revision)

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SPECIFICATION FOR ENDOSULFAN, TECHNICAL

(First Revision)

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Indian Standard

SPECIFICATION FOR ENDOSULFAN, TECHNICAL

(First Revision)

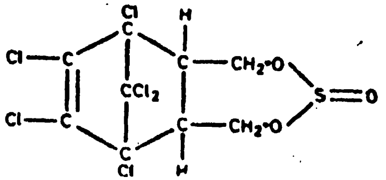
0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 15 February 1978, after the draft finalized by the Pest Control Sectional Committee had been approved by the Agricultural and Food Products Division Council and the Chemical Division Council.

0.2 Endosulfan is a non-systemic and stomach insecticide and is effective against agricultural and household insects/pests.

0.3 This standard was first published in 1967. Subsequently Amendment No. 1 was issued. In the first revision the packaging, sampling and cautionary notice requirements had been modified. Opportunity has been taken to refer IS: 6940-1973* to bring uniformity in testing procedure for the various requirements given in the standard.

0.4 Endosulfan is the accepted common name by the International Organization for Standardization (ISO) for the insecticidal chemical 6, 7, 8, 9, 10, 10-hexachloro-1, 5, 5a, 6, 9, 9a-hexahydro-6, 9-methano-2, 4, 3-benzo [*e*]-dioxathiepin 3-oxide. The empirical and structural formulae and the molecular mass of endosulfan are as indicated below:

Empirical Formula	*Structural Formula*	*Molecular Mass*
$C_9H_6Cl_6O_3S$		406·95

0.5 In the preparation of this standard, due consideration has been given to the provisions of the Insecticides Act, 1968 and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under these, wherever applicable.

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*Methods of tests for pesticides and their formulations.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for endosulfan, technical.

2. REQUIREMENTS

2.1 Description — Endosulfan, technical shall be in the form of light to dark brown solid and shall be free from foreign matter or added modifying agent(s).

2.2 The material shall also comply with the requirements given in Table 1.

TABLE 1 REQUIREMENTS FOR ENDOSULFAN, TECHNICAL

Sl No.	Characteristic	Requirement	Method of Test, Ref to	
			Appendix of This Standard	Cl No. of IS : 6940-1973*
(1)	(2)	(3)	(4)	(5)
i)	Active ingredient content, percent by mass, *Min*	90	A	—
ii)	Moisture content, percent by mass, *Max*	0·1	—	4
iii)	Material insoluble in acetone, percent by mass, *Max*	1·0	—	9
iv)	Acidity (as H_2SO_4), percent by mass, *Max*	0·1	—	11.3

*Methods of tests for pesticides and their formulations.

3. PACKING AND MARKING

3.1 Packing — The material shall be packed according to IS : 8190 (Part I)-1976†.

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*Rules for rounding off numerical values (*revised*).

†Requirements for packing of pesticides: Part I Solid pesticides.

3.2 Marking — The container shall bear legibly and indelibly the following information and any other information as is necessary under the Insecticides Act and Rules:

a) Name of the material;

b) Name of the manufacturer;

c) Batch number;

d) Date of manufacture;

e) Active ingredient content, percent (*m/m*);

f) Net mass of contents; and

g) The minimum cautionary notice worded as in the Insecticides Act and Rules.

3.2.1 When packed in bags, the pictorial marking for 'USE NO HOOKS. DO NOT PUNCTURE' as contained in IS : 1260 (Part II)-1973* shall be stencilled on the bags.

3.2.2 Each container may also be marked with the Standard Mark

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

4. SAMPLING

4.1 Representative samples of the material shall be drawn as prescribed in 'Indian Standard methods for sampling of pesticides and their formulations (*under preparation*).

NOTE — Till such time the standard under preparation is published, the matter shall be as agreed to between the concerned parties.

5. TESTS

5.1 Tests shall be carried out by the appropriate methods referred to in col 4 and 5 of Table 1.

5.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1977†) shall be employed in the tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

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*Pictorial marking for handling and labelling of goods: Part II General goods (*first revision*).

†Specification for water for general laboratory use (*second revision*).

APPENDIX A

[*Table* 1, *Sl No.* (i)]

DETERMINATION OF THE ACTIVE INGREDIENT

A-1. PRINCIPLE OF THE METHOD

A-1.1 The principle, in determination of the active ingredient of endosulfan, namely, 6, 7, 8, 9, 10, 10-hexachloro-1, 5, 5a, 6, 9, 9a-hexahydro-6, 9-methano-2, 4, 3-benzo [e]-dioxathiepin 3-oxide, is based on hydrolysis of endosulfan with methanolic sodium hydroxide and estimating the sodium sulphite (Na_2SO_3) so formed iodometrically.

A-2. REAGENTS

A-2.1 Methanol

A-2.2 Sodium Hydroxide — pellets.

A-2.3 Phenolphthalein Indicator Solution — one percent (*m/v*) in rectified spirit.

A-2.4 Standard Sulphuric Acid — 5 N.

A-2.5 Standard Iodine Solution — 0·1 N.

A-2.6 Standard Sodium Thiosulphate Solution — 0·1 N.

A-2.7 Starch Solution — 0·2 percent, freshly prepared.

A-3. PROCEDURE

A-3.1 Weigh accurately about 0·5 g of the material and transfer it to a 250-ml flask. Add 100 ml of methanol by a pipette. Introduce about 1·5 g of sodium hydroxide pellets (about 15 pellets). Connect the flask to a reflux condenser and boil the contents at least for 2 hours. Shake the flask occasionally. Wash down the condenser with 20 ml of methanol and 50 ml of distilled water. Add one drop of the phenolphthalein indicator solution. Neutralize with standard sulphuric acid. Add a few drops of dilute sodium hydroxide to restore the indicator colour and to prevent any loss of sulphur dioxide.

A-3.2 For accurate determination of the sulphite, it is essential to add the sodium sulphite to an excess of acidified standard iodine solution and back titrate the excess of iodine with standard sodium thiosulphate solution.

A-3.3 Take 40 ml of standard iodine solution in a 500-ml glass stoppered flask from a burette. Add 10-15 ml of the standard sulphuric acid to make sufficiently acidic and shake it slowly (*see* Note). While agitating, add the aliquot containing sulphite solution. Rinse the flask well with small portions of distilled water until all the sulphite has been transferred (the washing procedure should be continued until there is insufficient sulphite in the flask to bleach a small drop of iodine). The final volume in the iodine flask should be about 225 to 250 ml.

NOTE — This process will have to be conducted in an evacuated flask.

A-3.4 Back titrate the excess iodine with the standard sodium thiosulphite solution, using starch solution as indicator and titrate until the blue colour disappears.

A-3.5 Carry out a blank determination by titrating 40 ml of the standard iodine solution to which 175 ml of water acidified with the same amount of standard sulphuric acid that has been added in the sample with standard sodium thiosulphate solution.

A-3.6 The difference in the volume of sodium thiosulphate solution indicates the iodine equivalent consumed by endosulfan.

A-4. CALCULATION

A-4.1 Active ingredient, percent by mass $= \frac{V \times 2{\cdot}035}{M}$

where

V = volume of 0·1 N iodine solution as used in the test, and

M = mass in g of the sample taken for the test.

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